REMARKS

The Office examined claims 1-16 and rejected claims 1, 3, 5 7, 9 & 12-14. Claims 2, 4, 6 & 8 are allowed. With this paper, claims 17-19 are added, but no claims are cancelled, and so claims 1-19 are now pending.

This paper follows also a telephone interview with the Examiner on 2 August 2007 in which applicant's attorney asked the Examiner whether the Examiner intended to indicate that Jokinen included the text "an average of 16 symbols of the received training sequence." The Examiner explained that he did not intend to so indicate, and that the subject text is to be understood as only his interpretation of the teachings of Jokinen. The Examiner and applicant's attorney also discussed the scope of claim 1 in comparison with Jokinen. No agreement was reached.

Drawing amendment

With this paper, Figure 8 is corrected so that Yc" is indicated to be:

$$Y_c'' = [(Y_{c1} + Y_{a2})/2 \;\; Y_{c2}] = [Y_{c1}' \;\; Y_{c2}]$$

instead of

$$Y_c'' = [(Y_{c1} + Y_{a2})/2 \;\; Y_{c2}] = [X_{c1}' \;\; X_{c2}]$$

as is mistakenly shown in the application as filed. Support for the correction is at page 12, line 20, where it is explained that:

> Thus, the calculated correlation sequence Y_c'' [shown in Figure 8] is given by,
>
> $$Y_c'' = [(Y_{c1}+Y_{a2})/2 \;\; Y_{c2}] = [Y_{c1}' \;\; Y_{c2}],$$
>
> where the square brackets [] indicate concatenation of the sequences inside the brackets, i.e. Y_{c1}' and Y_{c2}.

Rejections under 35 USC §102

At section 1 of the Office action, claims 1, 3, 5, 7, 9 & 12-14 are rejected under 35 USC §102 as being anticipated by EP 0701334, with Harri Jokinen as inventor, hereinafter Jokinen (referred to as Frain in the Office action, Frain being the first name in the firm representing Jokinen, not the name of an inventor).

The rejected independent claims are method claim 1, and also apparatus claims 9 and 14, both reciting limitations corresponding to those of claim 1. Claims 1, 9 & 14 recite *calculating a (one) correlation sequence based on averaging symbols of a received training sequence*, and then performing a set of correlations[1] using the calculated correlation sequence. In contrast, Jokinen discloses obtaining *two different correlation sequences* from a training sequence, performing two sets of correlations using the two different correlation sequences, and then *averaging the results of the two sets of correlations*.

For the reasons given below, applicant respectfully submits that claims 1, 9 and 14 as examined are allowable over Jokinen, but in order to advance prosecution, applicant now more distinctly claims the process used to calculate a correlation sequence, by reciting that the process is not just based on averaging symbols of a received training sequence, but that the process includes selecting (at least) two portions of the received training sequence of a same length and averaging respective symbols of the (at least) two portions of the received training sequence to form

[1] Calculating a correlation between two sequences involves multiplying the values of respective symbols of the two sequences and adding up the results to obtain a single numerical result. Prior to the multiplying of respective terms, the two sequences are fixed in position/ phase relative to each other (e.g. by shifting one or the other, and continuing the non-shifted sequence to make it long enough) to establish which term in each corresponds to which term in the other, and so the correlation result depends on the two sequences and also their respective positions/ phases.

an average sequence and *optionally* adding to the average sequence another portion of the training sequence. As set out below, Jokinen cannot fairly be said to teach or suggest any such calculation of a correlation sequence. Applicant also notes that the application at page 14, beginning line 27, provides that:

> … the training sequence need not necessarily be in the middle of a burst. Thus e.g. in the digital radiotelephone system used in the United States, a TDMA frame consists of six time slots of 162 symbols each, and a burst transmitted in a time slot from the base station to the mobile station always begins with a synchronization burst of 14 symbols (typically representing 28 bits), which is used as a training sequence. Also, the additional part need not be on both sides of the correlation sequence, as in the GSM system, but instead there could be only one additional part which is either before or after the correlation sequence.

Applicant therefore respectfully submits that applicant is entitled to claim more than what is recited in claim 2, i.e. more than merely "calculating a correlation sequence using the received training sequence, by averaging a predetermined number of symbols from the first end of the received correlation sequence with a predetermined number of corresponding symbols from the additional part at the second end of the received training sequence."

In the present application, the term "replica" is used, where in Jokinen the term "reference sequence" is used. In the present application the term "training sequence" is used in the same way as in Jokinen. Finally, in the present application the term "correlation sequence" is used in the same way as in Jokinen, i.e. it is a sequence of symbols that is compared with the replica/ reference sequence. In both the application and in Jokinen, the "correlation sequence" is obtained from the training sequence, but in Jokinen there is no averaging of the symbols of different parts of the training sequence to obtain a (single) correlation sequence, as is required by all the claims of the application.

Ordinarily, the correlation sequence that is used is embedded in the training sequence, and "additional parts" are added before and after this "original" training sequence. Jokinen teaches that a different correlation sequence can be used instead of the original, but teaches only that "a correlation sequence different from the original correlation sequence can be *selected* from the training sequence, so that the new correlation sequence has a length which is in accordance with the original correlation sequence, but partly comprises symbols of the additional part." [Emphasis added.] See page 3, line 33. Jokinen then teaches using e.g. two different correlation sequences, each obtained by selection from the original correlation sequence and the additional part. Each is then used to perform a correlation (with the reference sequence), and the results of the *correlations* are averaged, as opposed to averaging *respective symbols in two different parts of the training sequence*, as in the invention.

Thus, according to Jokinen two sets of correlations are performed, whereas the recited averaging of the invention allows relying on only a single set of correlations. Applicant respectfully submits that as there is no teaching or suggestion in Jokinen of even addressing the problem of how to reduce the number of sets of correlations.

Figures 3, 7 & 8 of the application show how the invention differs from the prior art. Instead of using either a portion of the received correlation sequence (Y_c) as in conventional estimation methods, and instead of using a second correlation sequence (Y_c') as in the two-correlation method disclosed by Jokinen, the invention calculates a correlation sequence--called the calculated correlation sequence (Y_c'')--from a received training sequence including a received correlation sequence (Y_c). This is done e.g. as indicated in Figure 8, but at any rate is based on averaging symbols of the received training sequence. Figure 9 shows that instead of performing two correlations (or two

sets of correlations) as in the two-correlation method disclosed by Jokinen and then averaging the correlations, the invention performs a single set/ plurality of correlations as in conventional estimation methods, but uses the *calculated* correlation sequence (Y_c") instead of the received correlation sequence (Y_c). Thus the invention provides a correlation result using only half the number of the processor operations as required by Jokinen.

The Office asserts that Jokinen discloses:

> [a] derived or calculated correlation sequence [that] is "an average of 16 symbols of the received training sequence" RXc

citing figs. 3 and 5 and page 3, lines 20-39, and page 4, lines 5-27. From the telephone interview with the Examiner, applicant's attorney understands this statement as an assertion of how the Examiner interprets that teachings of Jokinen at the cited locations, *not* as an assertion that Jokinen includes the text "average of 16 symbols of the received training sequence." Indeed, applicant's attorney has carefully reviewed Jokinen both at the cited locations and elsewhere and can find no such text, now any text that applicant's attorney sees would be suggestive of such a teaching. However, assuming *arguendo* that Jokinen could fairly be said to provide such a teaching, such a teaching (of deriving or calculating a correlation sequence that is "an average of 16 symbols of the received training sequence") would not be useful since averaging 16 symbols of (the 26-symbol) training sequence would result in one single number/ symbol, namely the average of the sixteen symbols, but not a *sequence* of symbols (a correlation sequence) that can be used to perform correlations with the reference *sequence*/ replica (sequence), which is sixteen symbols long. So it is unlikely that Jokinen does include such a teaching. But even if it does, such a teaching is not encompassed by any of claims 1, 9 and 14, since it provides a single numerical

result, not a sequence, whereas claims 1, 9 and 14 require "calculating a correlation *sequence* based on averaging symbols of the received training sequence." [Emphasis added.]

For the reasons given for the claims argued, and at least by virtue of the dependencies of the claims not argued, applicant respectfully requests that all the rejections under 35 USC Sec. 102 be withdrawn.

New claims

New claims 17-19 all recite that the two portions now recited in corresponding independent claims 1, 9 and 14 are a first portion of a correlation sequence included in the received training sequence and a second portion from a part of the received training sequence additional to the correlation sequence. Support is provided by e.g. Figure 8. These new claims are believed allowable for at least the same reasons as given for claims 1, 9 and 14.

Conclusion

For all the foregoing reasons it is believed that all of the claims of the application are in condition for allowance and their passage to issue is earnestly solicited. Applicant's attorney urges the Examiner to call to discuss the present response if anything in the present response is unclear or unpersuasive.

Respectfully submitted,

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